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"A Matter of Time: Phases of Customer Co-Creation Community Participation and Their Impact on Customer Behavior"

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Master Thesis
Double Degree NOVA SBE & Maastricht University

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Signature: ……..

Abstract

Despite the growing relevance of co-creating customer communities only little scientific evidence is available on their impact on transactional behavior of participants. Previous research has mostly used self-reported data or distinguished only between during and pre-community phases obtaining mixed results. However, the author proposes that co-creating community activity takes place in five distinguishable phases and changes in transactional behavior are limited to certain phases. Using 33 months of transactional data of a Dutch online auction provider a study was conducted covering all five phases of the community co-creation process from community planning over community set-up, co-development and co-testing to post-launch. The overall results indicate mixed effects of community participation on the different transactional variables during the co-creation process. Community participation had positive effects on auctions listing behavior at the community set-up, co-development and post-launch phases, whereby the number of auctions listed peaked during the community set-up phase. These results suggest that the impact on transactional behavior differs between co-creation phases and different psychological mechanism limited to certain phases might trigger the respective changes.

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Ads	Auctions listed
ANOVA	Analysis of variance
Asq	Questions asked to vendors
Bids	Biddings placed
CCC	Co-creation communities
C2C	customer-to-customer
Ftr	Payments send via PayPal
GLM	General linear model
LIWC	Linguistic inquiry and word count
MROC	Market research online community
NPD	New product development
OCC	Online customer communities
ROI	Return on investment
WOM	Word-of-mouth

1. Introduction

Customer co-creation can help to develop products and services that offer superior value to customers and decrease development costs and economic risks for companies (Alam, 2002; C. Baldwin, Hienerth, & Von Hippel, 2006; Lau, Tang, & Yam, 2010; Marchi, Giachetti, & de Gennaro, 2011; A. F. Payne, Storbacka, & Frow, 2007). Although the idea of customer co-creation is not a very recent development many aspects of integrating customers into companies' innovation processes are still not yet well understood (Hoyer, Chandy, Dorotic, Krafft, & Singh, 2010). Nevertheless, customer co-creation increasingly replaces the previously typical producer driven innovation model by allowing customers and companies to both play active roles in determining the final innovation outcome by selecting elements of a new product or service (O'Hern & Rindfleisch, 2010). Several studies have examined how customer co-creation can contribute to companies' new product development processes and overall success (C. Y. Baldwin & von Hippel, 2010; Füller, Bartl, Ernst, & Mühlbacher, 2006; Hoyer et al., 2010; McAlexander, Schouten, & Koenig, 2002), resulting in practitioners and academics placing great trust and expectations on it (Antorini & Muñiz, 2013; Hemetsberger & Reinhardt, 2004; Keinz, Hienerth, & Lettl, 2012).

One way for companies to communicate with their customers and integrate them into their innovation processes is by using so-called user communities (Collinson, 2010; Dahlander & Frederiksen, 2012; Franke, Keinz, & Schreier, 2008; Mitrović, Paltoglou, & Tadić, 2010) or customer communities (Manchanda, Packard, & Pattabhiramaiah, 2012; Pitta & Fowler, 2005). Typically these kinds of communities are set up in an online environment; in the following they will be referred to as online customer communities (OCC). The individual settings and functionalities of OCCs can differ from case to case but typically customers who join the community are able to communicate with each other through posts in discussion forums, express suggestions and ideas as well as rate ideas generated by other users or company employees. This form of integrating customers is boosted by the trend of digitalization as well as increased usage of the internet in general and social media in

particular. Since it enables companies to communicate in an interactive and cost efficient way with their customers (Antorini & Muñiz, 2013), an increasing number of companies is taking advantage of OCCs. Such communities can either be operated and owned by the company itself or by a third-party (e.g. Facebook).

Recently academics and practitioners have raised doubts about the benefits of using third-party hosted OCCs regarding insufficient ROI (Return on investment) due to the comparably low engagement of participants. A study conducted by the Ehrenberg-Bass Institute reveals that only approximately 1% of fans of the biggest brands on Facebook are actually actively engaging with the brand (Creamer, 2012). Additionally, the commonly stated lack of control over negative word-of-mouth (WOM) can be even more severe for third-party hosted communities. As a result more and more companies are now operating their own OCCs and expressing high levels of confidence in this tool (Manchanda et al., 2012). Despite this fact only very little academic research has been conducted to assess the impact of community participation on transactional behavior. (Algesheimer, Borle, Dholakia, & Singh, 2010; Manchanda et al., 2012; McAlexander et al., 2002).

However, assessing the impact community participation might have on transactional behavior is critical in order to determine the economic benefits of operating OCCs. Due to the fact that customer community participants show high levels of engagement with the firm's products and brand (McAlexander et al., 2002), it is possible that community participation not only positively influences beneficial customer behavior in general, such as the mutual support of each other (Bagozzi & Dholakia, 2006b), but also the direct transactional behavior of the individual community participants. Despite its importance, the available academic research on this issue is mostly grounded on surveys and the usage of self-reported data on purchase intentions and willingness to pay (Porter & Donthu, 2008; Srinivasan, Anderson, & Ponnavolu, 2002).

To the author's best knowledge only three scientific studies (Algesheimer et al., 2010; Manchanda et al., 2012; Zhu, Dholakia, Chen, & Algesheimer, 2012) have been using actual behavioral data to

determine the impact of customer community participation on transactional behavior and revealed mixed results. Those studies were also conducted to assess the impact of participation in the more typical ongoing customer communities aiming mostly on a general increase in engagement through social interaction (Algesheimer, Dholakia, & Hermann, 2004; Casaló, Flavián, & Guinalíu, 2007).

Nevertheless, studying co-creation communities with a limited duration and the focus on co-creating one or several closely connected innovations can offer certain advantages over studying the typical on-going community type. Certainly, such a focused community undergoes different phases similar to a general New Product Development (NPD) process until the final innovation is ready to be launched. By examining the transactional behavior throughout this whole process valuable insights into the dynamic nature of the underlying mechanisms that trigger changes in transactional behavior could be obtained. As a result this study intends to find new insights on the following research question:

What are the transactional behavior effects of community engagement during different co-creation phases?

In addition to this general research question the following sub-questions will be answered in order to address the overall research question and gain further insights.

1.) Is there a difference in transactional behavior between community participants and comparable non-participants during the co-creation process?
2.) Does the difference in transactional behavior vary among different stages in the co-creation process?
3.) Does communicating about the existence of a customer co-creation community have an influence on the transactional behavior of non-participants?

Answering these questions can reveal important insights for academics and practitioners alike and can further enhance this previously underrepresented area of research on customer community engagement. First, it might reveal reasons for the mixed results obtained by previous scientific

studies, thereby advancing the understanding of changes in transactional behavior. Moreover, the understanding of the exact timing of behavioral changes enables managers to better assess and interpret the overall impact of customer community engagement. Finally, examining if communication about co-creation efforts changes transactional behavior of non-participants can also help to maximize the positive effects of providing customer communities.

Subsequent to this introductory chapter, the following chapters are structured in the following order: First, the theoretical background of the research study will be discussed to derive hypotheses to guide the further research efforts (chapter 2). Next, the research design, setting and methodology will be explained (chapter 3). Afterwards, the previously developed hypotheses will be tested in the data analysis chapter and the results of the statistical tests will be presented (chapter 4). Further, the results will be discussed (chapter 5). Finally the author will highlight theoretical as well as managerial implications of the findings, present limitations of this study and suggestions for further research (chapter 6).

2. Theoretical background and hypothesis

2.1. From producer innovation to co-creation

"Innovation distinguishes between a leader and a follower" (Steve Jobs)

Following Steve Jobs' line of reasoning, innovation is increasingly becoming one of the major concerns for managers worldwide in order to establish and maintain their companies' competitiveness and profitability (Kanter, 2006). As a result, other ways of innovating apart from the classical producer-driven innovation gain further attention. Although the dominant way of innovating has been the producers' model, in which the most important innovations would originate from profit-driven producers and user innovation only plays an unimportant part, it becomes increasingly obvious that this is just one way to innovate among others (C. Y. Baldwin & von Hippel, 2010). In addition to the producer and profit-driven innovation model there are at least two other ways of organizing innovation activity namely the innovation by users, both companies and individuals, as well as a collaborative open innovation model. Whereas user innovations are innovations that are developed through individuals or firms for their own usage, open collaborative innovations are developed through a number of individual innovators who openly share their contribution to the overall innovation. Very common examples for the latter are open source software programs such as the operating system "Linux" or the internet browser "Mozilla".

Previously, generating and developing new products and services was almost exclusively done by the companies' employees themselves and customers were only seen as a source of information that can help producers to find and develop marketable innovations (Poetz & Schreier, 2012). However, by engaging customers into the innovation process and letting them take over active parts that were previously reserved for company employees (Antorini & Muñiz, 2013), customers can co-create important knowledge that is beneficial for the innovative processes within the firm (Fuchs & Schreier, 2011; Mahr, Lievens, & Blazevic, 2013; Nambisan & Nambisan, 2008; von Hippel, 2009). Particularly,

co-creation refers to the collaborative creation of value by combined efforts of companies and customers in which both parts play active roles in determining the final outcome by selecting elements of a new product or service (O'Hern & Rindfleisch, 2010; Prahalad & Ramaswamy, 2004). Many studies have shown potential benefits of customer co-creation on several levels and many researchers claim that we are in the middle of a paradigm shift towards primarily co-created innovations (Keinz et al., 2012). For example, customers can help by increasing the product fit to customer needs through integrating their unique knowledge of their own needs and preferences into the product and service development (Alam, 2002; Antorini & Muñiz, 2013; Poetz & Schreier, 2012). Since successful new product development (NPD) depends on a good understanding of customer needs (Hauser, Tellis, & Griffin, 2006; Ogawa & Piller, 2006) and identification of potential markets in advance (Antorini & Muñiz, 2013), companies can reduce the economic risks of launching new products. As a result, companies can realize productivity gains through increased effectiveness of their innovative activities (Hoyer et al., 2010). Furthermore, companies can make use of the creative capabilities of their customers in order to identify previously unknown needs without having to spend a lot of resources (Hoyer et al., 2010; Ind & Coates, 2013), thus increasing efficiency of the innovation efforts. One successful example is the co-creation effort of Lego and enthusiastic customers which led to the development of numerous very successful products such as the LEGO Mindstroms and LEGO Modular Building series (Antorini & Muñiz, 2013).

Apart from these benefits for the customers and producers engaging in particular co-creation efforts, academic studies have shown that social welfare is very likely to be increased by those kinds of innovative activities as well (Henkel & von Hippel, 2005). Consequently, it is not surprising that more and more companies look for new ways of incorporating their customers more actively into their innovation processes. There are several ways of how to do so and academics have devoted substantial attention towards several different ways of facilitating an open and user-centered innovation process (Chesbrough, 2003). Common approaches are the development of customization toolkits to empower users to innovate themselves (Franke et al., 2008; von Hippel, 2001), the focus

on cooperation with and incorporation of heavily involved and highly innovative so called “lead-users” (Franke, Von Hippel, & Schreier, 2006; Hienerth & Lettl, 2011) as well as making use of virtual communities (Heiskanen, Hyysalo, Kotro, & Repo, 2010; Schau, Muniz Jr, & Arnould, 2009). However, previous academic research has obtained mixed results of co-creation efforts on participating customers’ behaviors. Therefore additional research is necessary to gain a better understanding.

2.2. **Co-creation communities**

Virtual communities can serve several kinds of purposes and usages to both the users and the providers or owners of the virtual platforms the communities are acting on. There is a wide range of virtual communities available ranging from discussion boards to online multiplayer games such as “World of Warcraft” or “Second Life” (Spaulding, 2010). Communities in general tend to be build based on commonality of their members such as origin, occupation, interests or devotion to a brand (McAlexander et al., 2002). Because virtual communities can vary in several dimensions such as brand orientation, funding and governance (Wirtz et al., 2013), different community types have been the subject of academic studies using various definitions (Chan & Lee, 2004). As a result there is also not a clear and widely accepted terminology available. In Table 1 a collection of the most common community definitions and terms in connection to customer co-creation and innovation activities can be found.

However, for the purpose of this study one important distinction is the differentiation between communities of interest and brand focused communities. Communities of interests bring together members that match on their interest on specific topics or fields of interest without a particular focus on an individual company or brand (Armstrong & Hagel, 2000; Kannan, Chang, & Whinston, 2000). On the contrary, according to Muniz and O’Guinn (2001) a brand community is ”a specialized, non-geographically bound community, based on a structured set of social relations among admirers of a brand” (p. 412). Brand communities enable companies to closely monitor and connect to their customers (Kozinets, 2002) and are believed to increase customer engagement and loyalty

(Armstrong & Hagel, 1997; Brodie, Ilic, Juric, & Hollebeek, 2013; Casaló et al., 2007; Fournier & Lee, 2009). Often they are set up as discussion boards or chat rooms aimed at enabling several beneficial behaviors to develop through increased engagement and customer-to-customer (C2C) contact. Hereby, C2C communication in brand communities offers several not directly innovation related benefits such as reduced customer support costs (Bagozzi & Dholakia, 2006a; Williams & Cothrel, 2000) and usage of word-of-mouth (WOM) communication for marketing purposes (Algesheimer et al., 2004; Brown, Broderick, & Lee, 2007). In fact, complementing the companies' innovation activities is just one motivation among others meaning that sometimes virtual brand communities are only seen as a way to increase sales by spreading information about the brand, quality, price, and customer experiences (Huang & Farn, 2009).

Apart from these benefits of brand communities primarily resulting from social interaction between customers, there is also the possibility for companies to make use of online brand communities as a focused way of fostering innovative product or service developments. Such communities have been referred to as user-inclusive innovation communities (Heiskanen et al., 2010) or virtual new product development projects (Füller, 2006) in previous research publications. Such brand-related online innovation communities can vary in their exact structure and setting and represent one way of organizing co-creation efforts between customers and companies. In general, innovation communities can provide useful structure and tools to foster organized cooperation and have proven to increase both speed and effectiveness of innovation activities from development up to the diffusion of innovations (von Hippel, 2009). Often similar communities set up by companies try to fulfill a mixture of several of the beforehand mentioned functions from stimulating C2C communication, over gathering of customer insights up to foster co-creation activities. In addition to that, they are mostly set up as open platforms in which all customers who want to are able to engage in without being limited in time, aiming at an ongoing process. Nevertheless, there are also community set-ups which aim at co-creating one or several closely connected innovations. For instance the market research online communities (MROCs) that are operated by innovative market

research companies such as InSites Consulting in which only previously selected and invited customers are able to participate and that only exist for limited timeframe. Although those communities have been the topic of research studies (Ludwig et al., Forthcoming; Willems, De Ruyck, & Schillewaert, 2013) they can provide additional valuable insights in respect to the transactional impact of customer participation in co-creation activities.

Table 1: Different community types and definitions in the academic literature

Name	Author
Brand community	McAlexander et al. (2002); Muniz Jr. and O'Guinn (2001); Schau et al. (2009)
Global brand community	Cova, Pace, and Park (2007)
(Virtual) Lead user community	Hienerth and Lettl (2011); Mahr and Lievens (2012)
Online customer / User community	Antorini and Muñiz (2013); Chan and Lee (2004); Manchanda et al. (2012); Pitta and Fowler (2005)
User community	Collinson (2010); Dahlander and Frederiksen (2012); Franke et al. (2008); Ludwig et al. (Forthcoming); Mitrović et al. (2010)
User-inclusive innovation community	Heiskanen et al. (2010)
Virtual / Online brand community	Brodie et al. (2013); Noble, Noble, and Adjei (2012); Wirtz et al. (2013)
Virtual / Online community	Dholakia, Bagozzi, and Pearo (2004); Huang and Farn (2009); Mathwick, Wiertz, and De Ruyter (2008); Porter and Donthu (2008); Sanchez-Franco and Rondan-Cataluña (2010); Spaulding (2010)) Brown et al. (2007); Janzik and Raasch (2011); Kozinets (2002)
Virtual end user community	Frey and Lüthje (2011)
Virtual new product development project	Füller (2006)

2.3. **Phases in the co-creation process**

Due to the fact that co-creation is a broad and diverse process whose specific characteristics can vary widely depending on internal and external factors there is no distinctive description of the community based co-creation process to be found in the literature, yet. Previous research has largely used the NPD process as a starting point and basis for discussion and analysis of co-creation efforts. Schulze and Hoegl (2006) differentiate the NPD mainly in two parts, the "concept phase" and "development phase". In the concept phase initial product ideas are translated into product specifications in terms of product features, target markets and market positioning (Benedetto, 1999). In the development phase, the previously gathered product specifications are developed into prototype designs and technical solutions as well as tests are carried out (Cooper, Edgett, & Kleinschmidt, 2000). Similar to this Sawhney, Verona, and Prandelli (2005) differentiate between front-end and back-end phases which are corresponding to the concept and development phases in their individual parts. The difference between both approaches is that Sawhney et al. (2005) incorporate the ideation in the front phase whereas the ideation is left out by Schulze and Hoegl (2006). The most holistic description is used by Hoyer et al. (2010), suggesting the four phases ideation, product development, commercialization and post-launch. However, it is acknowledged by all authors that all these phases are not always easy to differentiate and follow clearly after each other, rather they are providing a rough and general segmentation of the NPD process.

As this study aims at exploring the transactional impact during the co-creation process of closed co-creation communities with a limited scope and duration, the phases of the general co-creation process can be derived partially building upon the previously explained approaches to NPD. However, adjustments have to be made especially because of the different approaches of both processes. The NPD process attempts to describe the necessary steps that have to be taken to develop an innovation whereas the co-creation process also describes the different stages of community building and its working processes. As a result, there are also important elements to be

considered previously to the actual co-creation activity in order to plan and design a positive relationship experience for community participants leading to effective co-creation activities (A. Payne, Storbacka, Frow, & Knox, 2009). However, during all phases the participants fulfill different roles similar to the three customer roles in the NPD process according to Nambisan (2002) namely: customer as a resource, customer as a co-creator and customer as a user. Certainly, the roles can vary from phase to phase and also within particular phases. They do not strictly follow after each other and are not mutually exclusive. Additionally, it has also been emphasized in the academic literature that the community participants also fulfill different roles at the same time and thus differ also from each other in terms of their individual role within the community (Moeller, Ciuchita, Mahr, Odekerken-Schröder, & Fassnacht, 2013).

Figure 1: Phases in the co-creation process

The *community planning phase* represents the time before the community is created, announced and users might be selected for later community participation. The future co-creation community participants are at that point in time regular customers and are not involved in any structured and firm organized co-creation effort.

The *community set-up phase* refers to the timeframe in which users are contacted and invited to prescreening surveys, informed about the possibility to join as well as selected for their future participation in the co-creation community. At the same time the virtual environment is developed and implemented to enable a productive community experience. In case of selective closed communities, participants are informed about their ability to participate.

The *co-development phase* represents the actual community timeframe including most of the activities referring to the concept and development phase of the NPD process according to Schulze and Hoegl (2006). The exact and detailed process depends hereby heavily on the type of co-creation goal, degree of structure, timeframe and ways of communication within the community. Activities in this phase can range from the assessment of needs, gathering of initial ideas, development of product or service specification and technical solutions up to first prototypes. The role of the participants is mostly defined as a resource for ideation and co-creator for design and development (Nambisan, 2002).

The *co-testing phase* takes part after the main community timeframe and could also be referred to as beta testing phase in which the developed product or service will be extensively tested and improved until it is ready to market and gets introduced to the general marketplace. The participant's role is now shifting to be focused on the role of a user by testing the product and giving support and feedback.

The *post-launch phase* is the phase in which the co-produced product or service is finally available on the general marketplace and community participants as well as the company can evaluate its success in the real business environment. However, it is not uncommon - especially for certain products or services such as software programs or technical equipment - to further improve the product to compensate for previously unidentified issues and imperfections.

These five phases represent the approximate distinction between phases with individual main focuses in terms of goals and roles taken over by the participants. However, as for the NPD phases the co-creation phases are not always clearly discriminable and exhaustive.

2.4. **Transactional impact during the co-creation process**

Despite the fact that co-creation in general and OCCs in particular have already been the focus of numerous research studies there are still important knowledge gaps to be found. For instance, only

limited research has been conducted on the changes of transactional behavior that participation in a customer communities might trigger for the respective participants (Manchanda et al., 2012). Using self-reported data, Algesheimer et al. (2004) and Porter and Donthu (2008) explored that community participation increases loyalty and purchase intentions among participants. In addition to that, research suggests that customer participation in OCCs is a factor that can be linked to increased purchase intentions and willingness to pay (Srinivasan et al., 2002). Still, only very limited research has been conducted using actual behavioral data rather than self-reported purchase and willingness to pay intentions. To the author's best knowledge only three studies have examined this area of research using actual behavior data.

Most recently, Manchanda et al. (2012) gained interesting results aiming to isolate the incremental customer expenditures generated through community participation. Their findings suggest the existence of a significant increase in post-launch expenditures, so-called "social dollars", of customers participating in a community of a large North American retailer operating both on- and offline stores. Furthermore, the data suggests that social dollars are moderated by the extent of customer's participation within the community. In a different context Algesheimer et al. (2010) conducted a study aiming at exploring the behavioral changes of new community members in an online community owned and operated by eBay Germany. Their findings reveal mixed effects on transactional variables after joining the community and suggest that participating buyers and sellers generally become more selective and efficient in their behavior. Specifically, they found no impact on the number of bids placed and a negative impact on the number of auctions listed. Whereas Zhu et al. (2012) concluded after a series of laboratory experiments and using the same eBay Germany dataset used by Algesheimer et al. (2010) that community participation increases risk taking and seeking tendencies due to perceived support by other community members.

The results of these studies suggest that there is no universally valid transactional impact of community participation and that it might differ based on the type of the community and business the company owning the community is operating in. Moreover, the impact on transactional behavior

might also differ between transactional variables depending on the respective underlying mechanism that triggers the potential changes. However, due to the lack of specific academic evidence so far it will be assumed in this study that transactional behavior is represented through each of the four transactional variables - bids places (Bids.), auctions listed (Ads.), questions asked to sellers (Asq.) and payments sent using PayPal (Ftr.) - in the same way. Furthermore, the available academic research has not explored if there is a dynamic nature behind any potential change in behavior for community participants. However, this question is particularly important when it comes to the use of the timely limited and innovation focused co-creation communities. As previously discussed the process and effects of such communities might differ from the effects of the more commonly researched OCCs.

Nevertheless, similar null to negative effects to the ones obtained by Algesheimer et al. (2010) could be expected at least during the active participation in the community. A possible explanation is that the high intensity and degree of cognitive attention towards the brand and company during this kind of community participation might lead to the initially counterintuitive negative effect. Similar effects have been reported by Larson, Redden, and Elder (2013) showing that exposition to pictures of food actually decreases the enjoyment of consuming these and similar foods. Their findings suggest that sensory simulations is an important mechanism underlying satiation indicating that evaluations of food can have a similar effect to actual consumption (Larson et al., 2013). The same mechanism could be involved in community engagement, especially in an innovation context which attracts people with a hunger for innovation and newness and isn't necessarily typical for customers in general. In this context participating by discussing and evaluating design and functionalities suggestions can have the same effect as using the actual homepage hence decreasing actual usage of the "real" product or service. The short term characteristic of co-creation communities could even lead to a further enhancement of negative effects due to the likelihood of a higher intensity of participation and engagement in such communities. In addition to that, the development of a new product or service might also decrease the desire and satisfaction received by using the previous old

product or service following the phenomenon of sensory-specific satiety researched by Rolls, Rolls, Rowe, and Sweeney (1981).

Following this line of reasoning the following is hypothesized:

H1: Participation in a co-creation community decreases the number of (a) bids placed / (b) auctions listed / (c) questions asked to sellers / (d) payments sent using PayPal during the actual community participation.

Still this negative effect could diminish after the end of the active community participation. Nevertheless, there is also the possibility that it might not go back to the previous level at once or even at all. On the contrary, there could be also a positive effect due to the better fit of the newly designed product or service to the individual customers' desires and needs. As a result, previously co-creating participants could be prone to increased behaviors towards their co-developed product or service after this is actually launched. This corresponds to the theory of psychological ownership which postulates that the investment of an individual's ideas, skills, and energy causes the individual to develop feelings of ownership the object (Pierce, Kostova, & Dirks, 2001). Ownership is also believed to increase satisfaction, commitment and performance within organizations (van Dyne & Pierce, 2004). Therefore community participants that feel a high degree of ownership of the co-created good could also be more committed to the brand and its products leading to increased transactions. All these points are leading to the following hypothesis:

H2: The launch of the co-created product or service increases the number of (a) bids placed / (b) auctions listed / (c) questions asked to sellers / (d) payments sent using PayPal of customers who were involved in the co-creation efforts.

Frequently stated benefits that are commonly used to explain changes in transactional behavior and other positive effects such as change in attitudes after joining an OCC are informational benefits and social benefits (Algesheimer et al., 2010; Casaló et al., 2007; Huang & Farn, 2009; Madupu & Cooley, 2010; Manchanda et al., 2012; Shang, Chen, & Liao, 2006). Informational benefits are for example

receiving enhanced information about a brand as well as its products and services. Social benefits are benefits such as personal utility derived from consuming content generated by other participants as well as receiving feedback on self-created content (Algesheimer et al., 2004; Balasubramanian & Mahajan, 2001; Mathwick et al., 2008; Porter & Donthu, 2008). Manchanda et al. (2012) reported that the observed social dollar was moderated by both the informational as well as the social benefits whereas informational benefits had the weaker effect. Receiving information about the content and process of co-creation efforts for actually not participating customers might offer some form of the weaker informational benefits for them. In addition to that, non-participants who receive information shouldn't exhibit the negative effects hypothesized from the sensory-specific satiety for H1. Therefore the following is hypothesized:

H3: Receiving information about existing co-creation efforts increases the number of (a) bids placed / (b) auctions listed / (c) questions asked to sellers / (d) payments sent using PayPal of non-community participants.

3. Methodology

This section provides an overview of the research design and data collection processes. First, the general research design is introduced. Next, the research setting as well as data collection and preparation is presented. Finally, measurements used in the analysis are presented and explained.

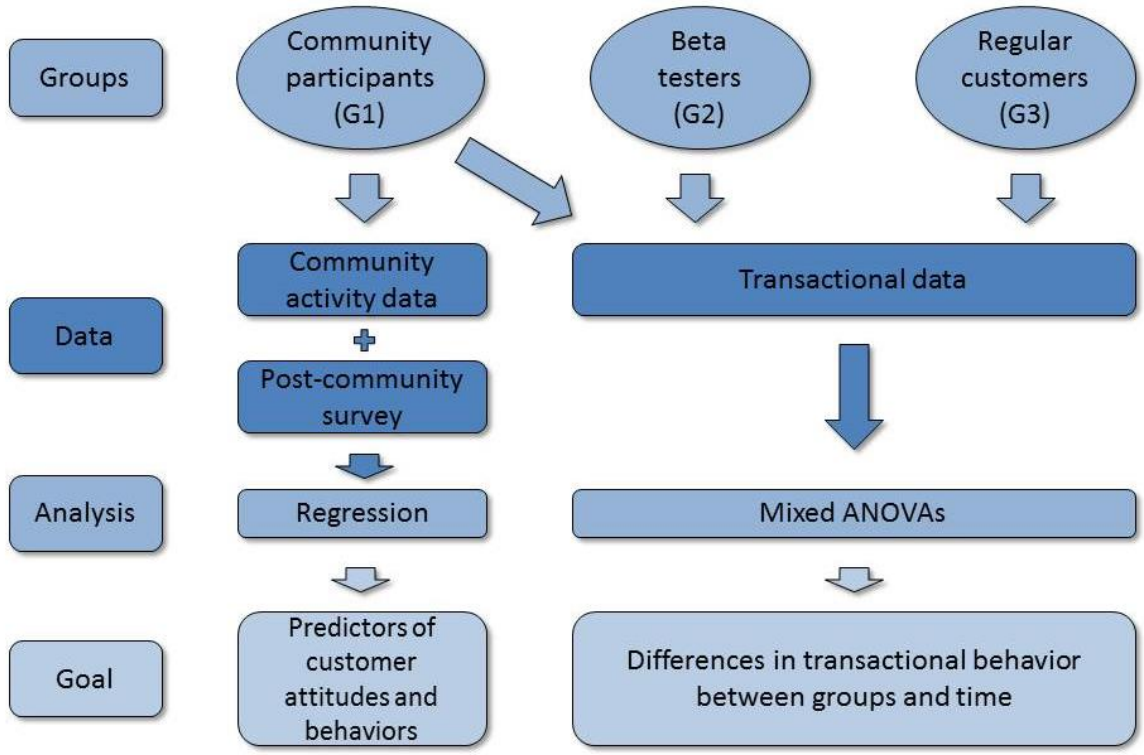
3.1. Research design

To assess the impact of community participation of consumers on transactional behavior during the whole co-creation process, a longitudinal research design was chosen and transactional data before, during and after a co-creation community was tracked and recorded for analysis. The benefit of choosing a timely limited and on one goal focused co-creation community is that it enables an analysis of the isolated dynamic effects of one particular co-creation effort. In order to cover all five phases of the previously outlined co-creation process 33 months of transactional data represented through four transactional variables were gathered for analysis for community participants (G1), beta testers (G2) as well as a control group of regular customers (G3). To statistically detect significant differences in transactional behavior between groups and over time, mixed between-within analyses of variance (ANOVAs) were used. The underlying rationale and a description of this statistical tool are given in greater detail in chapter 4.

Supplementary to this major part, community activity data, consisting out of an linguistic inquiry and word count (LIWC) analysis and participation intensity data, as well as a post-community survey were used to indicative identify predictors of community participants' attitudes and transactional behavior. The supplementary analysis was conducted using a statistical stepwise regression procedure. As for the previously mentioned mixed ANOVAs, the underlying rational and a description of this statistical tool are given in greater detail in chapter 4.

Figure 2 provides an overview over the general research model used, including the sampled groups, data available for analysis as well as the respective statistical analysis approach.

Figure 2: Research model



3.2.**Research setting**

Aiming for an analysis of transactional data covering the whole timeframe of one co-creation process the basis for this analysis is built by the data from the "Aurora" co-creation community operated by InSites Consulting and Marktplaats (eBay Netherlands). Marktplaats was founded in 1999 as an online auction website and acquired in 2004 by eBay. Therefore it is technically the Dutch equivalent of eBay, the world's largest online auction hosting company. InSites Consulting is an international operating consultancy specialized on marketing research through analysis of customer needs and fostering of co-creation in online communities. In 2011, eBay decided to change the design and functionalities of the Marktplaats website and rebuild it from scratch. For that purpose the "Aurora" community was created to take advantage of customer insights and co-create the new website together with current Marktplaats customers. "Aurora" was a closed co-creation community for the

limited duration of 11 weeks between September and November 2011. In total, 178 customers were invited to join, post and comment on ideas ranging from design to functionality.

3.3. Data collection and preparation

In order to being able to cover the whole timeframe of the co-creation community and compare the transactional data of participants, transactional data on four variables was collected for three different groups (see Table 2). Moreover, as a part of a supplementary analysis a follow-up survey on community participants and a linguistic analysis of all posts within the co-creation community using the LIWC software were conducted. In addition to that, the community participation data, e.g. number of posts and page visits, were recorded for analysis.

Due to the fact that not all of the initially 178 invited customers participated in the final community, the dataset had to be screened for errors and several dummy variables and Marktplaats moderators were removed leaving the transactional data of 149 invited participants available for further analysis. Afterwards, active participants were separated from non-active participants. In total, 119 customers logged in at least once to the "Aurora" community and will therefore be referred to in the following as participants. The reason for treating some participants that did not post during the community also as active participants stems from the fact that they logged in several times and therefore have been exposed to the content of the community activity. However, they may be defined as lurkers but will be included for this analysis. This is also consistent with the participation definition used by Algesheimer et al. (2010) for a similar study conducted on eBay Germany.

Table 2: Overview groups and sample sizes

Group	Sample Size (N)
Community participants (G1)	119
Beta testers (G2)	500
Regular customers (G3)	499

3.3.1. **Transactional data**

The transactional data of the above illustrated groups was collected for analysis. In order to compare the obtained results for external effects such as general change in transactional behavior due to changes in the economic development and the final website, community participants' behavior will be compared to the transactional behavior of a random sample of 500 so-called beta testers (G2) and 499 normal users (G3) during the same timeframe.

Beta testers (G2) and community participants (G1) were recruited out of the same pool of customers chosen by their transactional behavior in both seller and buyer behaviors and thus comparable to each other. To ensure that not only very heavy users were invited to those groups they were chosen out of three groups in terms of low, medium and high behavior. Regular customers (G3) represent the average typical customer without especially high usage or engagement with the firm.

Community participants (G1) received the treatment of participating in the community during the community timeframes, as well as being able to assess the new beta website during the co-testing phase (see co-creation phases on p. 19). Beta testers (G2) were able to use the newly designed website, as the outcome of the co-creation community efforts, earlier than the normal customers (see Beta testing phases p.21) and were able to access videos of community participants talking about their activity in the co-creation community as well as give feedback and thus help improve the beta version successively. Regular customers (G3) received no particular treatment apart from being able to read about the co-creation efforts in publicly available press releases and newspaper articles.

The transactional data for these three groups includes the monthly aggregate number of four key variables: auctions created (Ads.), bids placed (Bids.), questions asked to vendors (Asq.) as well as payments send via PayPal (Ftr.). These four variables represent important measurements for Marktplaats and were therefore chosen to be used to reflect the transactional impact community participation might have. The available data covers the timeframe from January 2011 until October 2013 on those four variables. Since the available data of October 2013 doesn't represent a full month

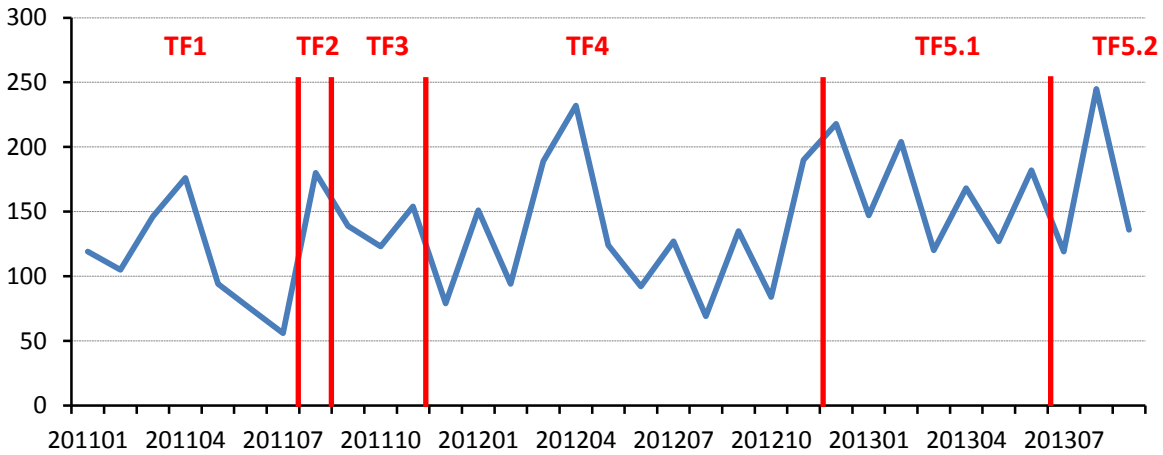
it was removed from the dataset. Hence, there are 33 months of transactional data available. The monthly data were allocated based on the following two different time segmentations:

Co-creation phases: The complete data covering the whole timeframe of 33 months was divided to represent the five phases of the co-creation process outlined in chapter two. The phase after the launch of the new website, e.g. post-launch, was divided into two separate timeframes to allow a better comparability of TF 1 and TF 5.1 due to the same length of 7 months. TF 5.1 will be used as the main representative for the post-launch phase.

Table 3: Data segmentation according to co-creation phases

Timeframe	Co-creation phase	Duration
TF 1	Pre-community phase	7 months
TF 2	Announcement phase	1 months
TF 3	Co-creation phase	3 months
TF 4	Co-testing phase	12 months
TF 5.1	Post-launch (phase 1)	7 months
TF 5.2	Post-launch (phase 2)	3 months

Figure 3: Visualization of data segmentation according to co-creation phases

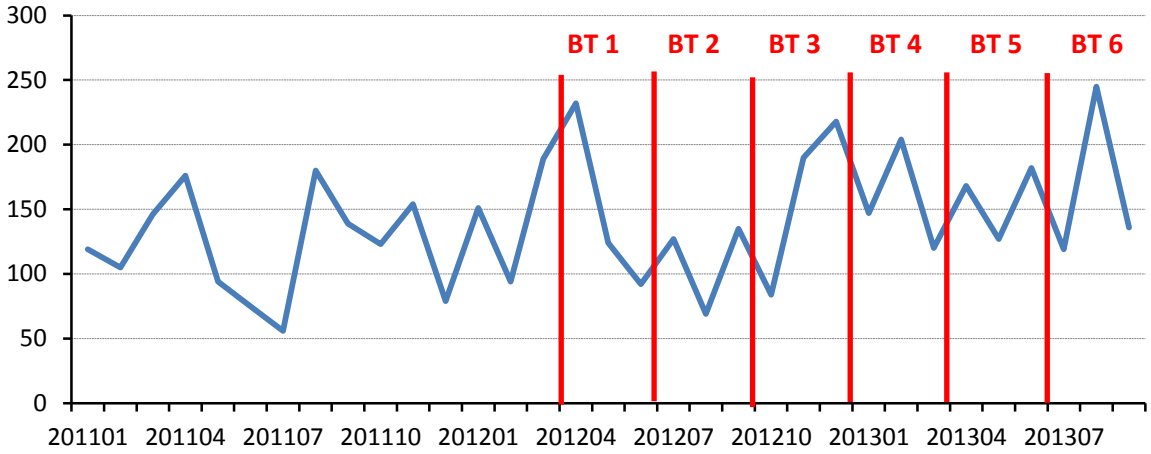


Beta testing phases: In order to assess if receiving information about the co-creation efforts impacts the transactional behavior of non-participants, the time segmentation of transactional data had to be adjusted to reflect the beta testing timeframe. This is mainly due to the fact that the previously used co-creation timeframes reflect the timeframes community participants (G1) underwent and don't exactly match the intervention beta testers (G2) received. Community participants (G1) ended their community engagement in November 2011 and were able to access to beta version of the new website and submit further feedback until the final launch in December 2012. Therefore, the timeframe between end of community and final launch is correctly described as co-testing phase for community participants (G1). However, for beta testers (G2) the co-testing timeframe (in this case named beta-testing timeframe) started at March 2012 (so four months later than community participants G1) with the invitation of beta testers to test the new platform and receiving of videos about community participants co-creation efforts. Therefore, different timeframes had to be used to adequately capture the intervention of receiving information about community participants' co-creation efforts. The phase ended with the final implementation and launch of the final website to the public in December 2012. To ensure that also small and dynamic effects can be detected the beta testing timeframe and post-launch phases of beta testers (G2) were each segmented in three timeframes each with a duration of three months (BT 1 – BT 6).

Table 4: Data segmentation according to beta testing timeframes

Timeframe	Co-creation phase	Duration
BT 1	Beta testing 1	March – May 2012
BT 2	Beta testing 2	June – August 2012
BT 3	Beta testing 3	September – November 2012
BT 4	Post-launch 1	December 2012 – February 2013
BT 5	Post-launch 2	March – May 2013
BT 6	Post-launch 3	June – August 2013

Figure 4: Visualization of data segmentation according to beta testing timeframes



3.3.2. **Community activity data**

In addition to the transactional data available, a LIWC analysis using LIWC2007 was conducted to analyze the emotional and cognitive processes expressed of every single active participant in all posts during the whole timeframe of the "Aurora" community. The LIWC tool was developed by Pennebaker, Chung, Ireland, Gonzales, and Booth (2007) and is a thesaurus-based computer software that assigns written texts on a word by word basis to 82 pre-defined and tested linguistic dimensions. The final LIWC scores represent the percentage of words that match each of the 82 dimensions. Thereby LIWC is providing an efficient and effective method for studying emotional, cognitive, structural and process components present in written texts and speeches in several different languages (Pennebaker et al., 2007). During the 11 week timeframe of the community 5,858 posts consisting out of 279,855 words were recorded for analysis. The data was checked for errors and posts from moderators were removed. Subsequently the data was manually converted to meet the LIWC format standards. All posts were matched to the respective participants and only the data of the 119 active participants was included in the further analysis. Furthermore, the community activity data from active participants was collected including number of total posts, number of page views and number of page visits.

3.3.3. **Post-community survey**

As a part of a supplementary analysis a post-community questionnaire was conducted to indicatively identify predictors of community participants' attitudes and transactional behavior. For that purpose, a post-community survey was developed and sent out to the 119 active participants at November 4th and was online available for two weeks until November 18th. Due to the fact that most participants are from the Netherlands the questionnaire had to be developed in Dutch. An English translation can be found in the appendix. In total 43 surveys were completed and valid (response rate of 36.1%).

3.4.**Measurements**

The following two tables provide an overview about the measurements used for the main and supplementary analysis. The survey includes several other measurements that have not been used for this particular study but were of great interest to InSites Consulting and Marktplaats and therefore included in the post-community survey to minimize the frequency of surveys. The measurements were mostly based on previously published academic literature and only minimally adjusted due to translations.

The transactional behavior is represented by the four transactional variables presented in Table 6. The two most important transactional variables from the business perspective are without a doubt the number of biddings placed on auctions (Bids.) and the number of auctions listed (Ads.). However, for this study it is assumed that all four variables will respond in the same direction, signaling a general increase or decrease in transactional behavior.

The measurements for the supplementary analysis can be found in Table 5. Cronbach Alphas were calculated for constructs measured with more than one item. All constructs are above the commonly accepted 0.7 threshold recommended by Nunnally (2010) and thus acceptable for further analysis.

Table 5: Measurements of the supplementary analysis

Variable	Measure	Data Source	Cronbach's Alpha	Reference
Overall customer satisfaction	One item on a 10 point Likert scale	Post-community survey	-	(Gustafsson, Johnson, & Roos, 2005)
Feeling of closeness to company	Degree of overlap between customer and Marktplaats identity	Post-community survey	-	(Aron, Aron, & Smollan, 1992)
Recommendation intention	One item on a 10-point Likert scale	Post-community survey	-	(Reichheld, 2003)
Motive to join: Contact with other users	One item on a 10-point Likert scale	Post-community survey	-	(Füller, 2006)
Motivation to join: Compensation	One item on a 10-point Likert scale	Post-community survey	-	(Füller, 2006)
Motivation to join: Show Ideas	One item on a 10-point Likert scale	Post-community survey	-	(Füller, 2006)
Motivation to join: Gain Knowledge	One item on a 10-point Likert scale	Post-community survey	-	(Füller, 2006)
Motivation to join: Intrinsic Innovation	One item on a 10-point Likert scale	Post-community survey	-	(Füller, 2006)
Motivation to join: Dissatisfaction	One item on a 10-point Likert scale	Post-community survey	-	(Füller, 2006)
Motivation to join: Curiosity	One item on a 10-point Likert scale	Post-community survey	-	(Füller, 2006)
Satisfaction with the community	One item on a 10-point Likert scale	Post-community survey	-	Authors contribution
Ownership of results	Three items on a 5-point Likert scale	Post-community survey	0.85	(Peck & Shu, 2009)
Subjective change on each of the four transactional variables	Four separate items on a 5-point Likert scale	Post-community survey	-	Authors contribution
Participation Intensity	# of total postings / # of page views / # of page visits	Community activity data	-	(Nambisan & Baron, 2007)
Emotionality	% of affective processes of total word count	LIWC Analysis	0.97	(Tausczik & Pennebaker, 2009)
Cognitive processes	% of cognitive processes of total word count	LIWC Analysis	0.97	(Tausczik & Pennebaker, 2009)
Social processes	% of social processes of total word count	LIWC Analysis	0.97	(Tausczik & Pennebaker, 2009)

Table 6: Measurements transactional behavior

Variable	Measure	Data Source
Biddings placed on auctions	# of biddings placed (Bids)	Transactional data
Auctions listed	# of auctions listed (Ads)	Transactional data
Questions asked to vendors	# of questions asked (Asq)	Transactional data
Payments send via PayPal	# of payments send via PayPal (Ftr)	Transactional data

4. Data analysis

This chapter presents the objective results of the conducted statistical tests as well as the tests of the previously developed hypotheses. First, the general outlier detection approach is discussed. Afterwards the results of the eight conducted analyses of variance (ANOVAs) are presented, followed by the results of the supplementary regression analyses of community activity data and survey results. All analyses were conducted using IBM SPSS 21.

4.1. Outlier detection

First the overall dataset was checked for outliers that may affect the following statistical tests. Due to the fact that very few heavy users typically display very extreme transactional behavior datasets with values on the combined scores above three standard deviations above the respective group mean on any transactional variable were excluded. That corresponds to common approaches to deal with outliers that could affect the conducted statistical tests (Pallant, 2010).

Table 7: Sample size before and after outlier detection

Group	Initial sample size	New sample size	Percentage excluded
Community participants (G1)	119	104	12,6 %
Beta-testers (G2)	500	437	12,6 %
Regular customers (G3)	499	450	9,81 %

4.2. Mixed between-within subjects ANOVA

An analysis of the descriptive statistics of the three groups revealed that the group of the regular users (G3) significantly differs from the two other groups of community participants (G1) and beta testers (G2). Detailed descriptive statistics about the three groups can be found in the appendix. The differences are likely to be a result of the selection procedure for community participants and beta testers that lead to an overrepresentation of heavy and medium users in the groups G1 and G2

compared to the overall average represented by G3. Therefore the following analysis is mainly focused on finding differences between the two comparable groups G1 and G2. The data of G3 mainly serves to detect overall changes in transactional behavior and put the behavioral changes of the two more comparable groups in perspective. The data of all three groups was taken into consideration prior to all analyses and interpretations of results. In order to examine if the transactional behavior of community participants (G1) differs from the transactional behavior of beta testers (G2), at some point of time mixed between-within subjects analyses of variance (mixed ANOVAs) were conducted. A mixed ANOVA combines the approaches of both a between-subjects design to compare different groups with a within-subjects design to compare different conditions or points in time (Tabachnick & Fidell, 2007). As a result two independent variables were used: Group belonging served as the between-subjects variable and time as the within-subjects variable. The mixed ANOVA examine whether there are any significant main effects for each of the two independent variables as well as if there is a significant interaction effect between them. The main effects for the between subjects variable "group belonging" describes if there is a statistical significant difference in the transactional behavior for the two groups. The main effect for the within subjects variable "time" describes if there is a statistically significant change in the transactional behavior over time. Finally, the interaction effect states if there is a statistically significant difference in transactional behavior over time for the two groups (Pallant, 2010).

4.2.1. **Mixed ANOVA co-creation phases**

Primarily, mixed ANOVAs were conducted based on the data segmentation representing the previously identified co-creation phases (Pre-community phase, Announcement phase, Co-creation phase, Co-testing phase, Post-launch Phase 1 and 2).

A mixed ANOVA was conducted to assess the impact of community participation on participants' transactional **bidding behavior (bids)** across all periods of the co-creation process. The transactional variables were non-normally distributed for each group as assessed by Shapiro-Wilk test (all variables

$p < .05$). However, due to the fact that ANOVAs are quite robust to violations of normality and the sample sizes are quite high ($n > 30$), the ANOVA should provide a valid result (Pallant, 2010). The assumption of sphericity was violated as assessed by Mauchly's test of sphericity ($p < .0005$). Therefore, the multivariate test statistic was used as suggested by Stevens (2002). The homogeneity of covariances was violated as assessed by a Box's Test ($p < .0005$), however due to the fact that violations are often ignored because this statistic is very sensitive (Pallant, 2010), it is assumed that it is safe to proceed with caution. The homogeneity of error variances was not violated as assessed by Levene's Test (all timeframes $p > 0.05$). There was no significant interaction between community participation and time, Wilks' Lambda = .99, $F(5,535) = 0.149$, $p = .98$, partial $\eta^2 = .001$. There was also no substantial main effect for time, Wilks'Lambda = .98, $F(5, 535) = 1.562$, $p = .169$, partial $\eta^2 = 0.014$. The main effect comparing the two groups was not significant, $F(1, 539) = 0.51$, $p = .822$, partial $\eta^2 = .002$, suggesting no difference in the transactional bidding behavior for the two different groups.

A mixed ANOVA was conducted to assess the impact of community participation on participants' transactional **auction listing behavior (ads)** across all periods of the co-creation process. The transactional variables were non-normally distributed for each group as assessed by Shapiro-Wilk test (all variables $p < .05$). The assumption of sphericity was violated as assessed by Mauchly's test of sphericity ($p < .0005$). Therefore, the multivariate test statistic was used. The homogeneity of covariances was violated as assessed by a Box's Test ($p < .0005$). The assumption of homogeneity of error variances was violated as assessed by Levene's Test (all timeframes $p < 0.05$). However, as ANOVAs are reasonably robust to violations of this assumption (Stevens, 2002) it is assumed that it is safe to proceed with caution. There was a significant interaction between community participation and time, Wilks' Lambda = .976, $F(5,535) = 2.627$, $p=.023$, partial $\eta^2 =.024$. A significant interaction result implies that the impact of one variable is influenced by the level of the second variable and simply reporting the simple main effects can be misleading (Pallant, 2010). Therefore, the effects for time and group have to be tested separately using a univariate General Linear Model (GLM). The

GLM approach was chosen over the one-way ANOVA approach because it also reports effect sizes. There were no statistically significant differences in auction listing behavior between the two groups at **T1**, F (1, 539) = 3.448, p = .064, partial η^2 = .006 and **T4**, F (1, 539) = 3.305, p = .007, partial η^2 = .006. However there was a statistically significant increased auction listing behavior between the two groups for **T2**, F (1, 539) = 13.877, p < .0005, partial η^2 = .025, **T3**, F (1,539) = 5.105, p = .024, partial η^2 = .009, **T5.1**, F (1, 539) = 10.896, p = .001, partial η^2 = .020, and **T5.2**, F (1,539) = 6.066, p = .014, partial η^2 = .011. There was no statistically significant effect of time on auction listing behavior (ads), for community participants (G1), Wilks' Lambda = .932, F (5, 99) = 1.444, p = .215, partial η^2 = .068. There was a statistically significant effect of time on auction listing behavior (ads) for beta testers (G2), Wilks' Lambda = .969, F (5, 432) = 2.728, p = .019, partial η^2 = .031. For the beta testers (G2), auction listing behavior was statistically increased between T3 and T5.1 (M = .694, SE = .196, p = .007).

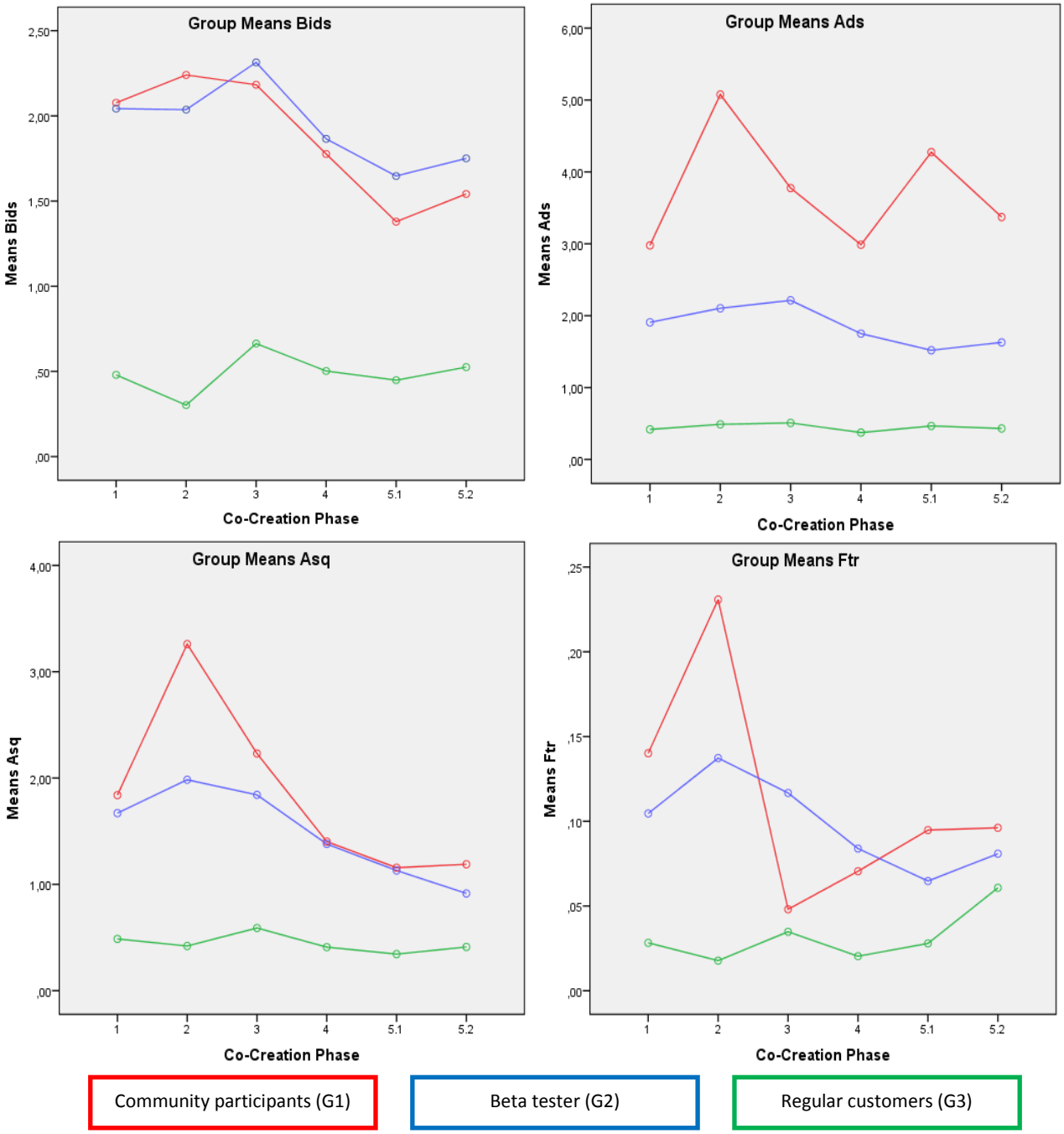
A mixed ANOVA was conducted to assess the impact of community participation on participants' **question to sellers asking behavior (asq)** across all time periods of the co-creation process. The transactional variables were non-normally distributed for each group as assessed by Shapiro-Wilk test (all variables p < .05). The assumption of sphericity was violated as assessed by Mauchly's test of sphericity (p < .0005). Therefore, the multivariate test statistic was used. The homogeneity of covariances was violated as assessed by a Box's Test (p < .0005). The homogeneity of error variances was not violated as assessed by Levene's Test (all timeframes p > 0.05) except for T2 (p = .015). There was no significant interaction between community participation and time, Wilks' Lambda = .983, F (5,535) = 1.853, p = .101, partial η^2 = .0017. There was a main effect for time, Wilks' Lambda = .907, F (5, 535) = 10.944, p < .0005, partial η^2 = 0.093 showing a statistically significant difference in question asking at the different time points. The number of questions asked to sellers was statistically significantly increased between TF 1 and TF 2 (M = -.867, SE = .232, p = .003) and decreased between TF 1 and TF 4 (M = -.364, SE = .116, p = .026), TF 1 and TF 5.1 (M = -.611, SE = .149, p = .001) as well as

TF 1 and TF 5.2 (M = -.703, SE = .148, $p < .0005$) suggesting an overall decrease after an short increase in TF 2.

The main effect comparing the two groups was not significant, $F (1, 539) = 2.956$, $p = .086$, partial $\eta^2 = .005$, suggesting no difference in the question asking behavior for the two different groups.

A mixed ANOVA was conducted to assess the impact of community participation on participants' **usage of PayPal** across all time periods of the co-creation process. The transactional variables were non-normally distributed for each group as assessed by Shapiro-Wilk test (all variables $p < .05$). The assumption of sphericity was violated as assessed by Mauchly's test of sphericity ($p < .0005$). Therefore, the multivariate test statistic was used. The homogeneity of covariances was violated as assessed by a Box's Test ($p < .0005$). The homogeneity of error variances was partially violated for T 2, TF 3 and TF 5.1 as assessed by Levene's Test (TF 1, TF 4, TF 5.2: $p > 0.05$ and TF 2: $p = .039$, TF 3: $p = .007$, TF 5.1: $p = .049$). There was no significant interaction between being a community participant and time, Wilks' Lambda = .987, $F (5,535) = 1.372$, $p = .233$, partial $\eta^2 = .013$. There was also no substantial main effect for time, Wilks' Lambda = .985, $F (5, 535) = 1.667$, $p = .141$, partial $\eta^2 = 0.015$. The main effect comparing the two groups was not significant, $F (1, 539) = 0.388$, $p = .533$, partial $\eta^2 = .001$, suggesting no difference in PayPal usage for the two different groups.

Figure 5: Group means of transactional variables during co-creation phases



4.2.2. **Mixed ANOVA beta testing timeframes**

In order to assess if receiving information about the co-creation efforts impacts the transactional behavior of non-participants, the respective beta testing timeframes (BT 1 – BT 6) were analyzed using the same approach as for the overall co-creation phases.

A mixed ANOVA was conducted to assess the impact of being chosen as a beta tester and receiving detailed information about the co-creation efforts of community participants on beta testers' **bidding behavior (bids)** across nine months of beta testing and nine months post launch.

The transactional variables were non-normally distributed for each group as assessed by Shapiro-Wilk test (all variables $p < .05$). The assumption of sphericity was violated as assessed by Mauchly's test of sphericity ($p < .0005$). Therefore, the multivariate test statistic was used. The homogeneity of covariances was violated as assessed by a Box's Test ($p < .0005$). The homogeneity of error variances was not violated as assessed by Levene's Test (all timeframes $p > 0.05$) except BT 5 ($p = .030$). There was no significant interaction between community participation and time, Wilks' Lambda = .995, $F(5,535) = 0.518$, $p = .763$, partial $\eta^2 = .005$. There was also no substantial main effect for time, Wilks' Lambda = .99, $F(5, 535) = 1.041$, $p = .393$, partial $\eta^2 = 0.010$. The main effect comparing the two groups was not significant, $F(1, 539) = 0.355$, $p = .552$, partial $\eta^2 = .001$, suggesting no difference in bidding behavior for the two different groups.

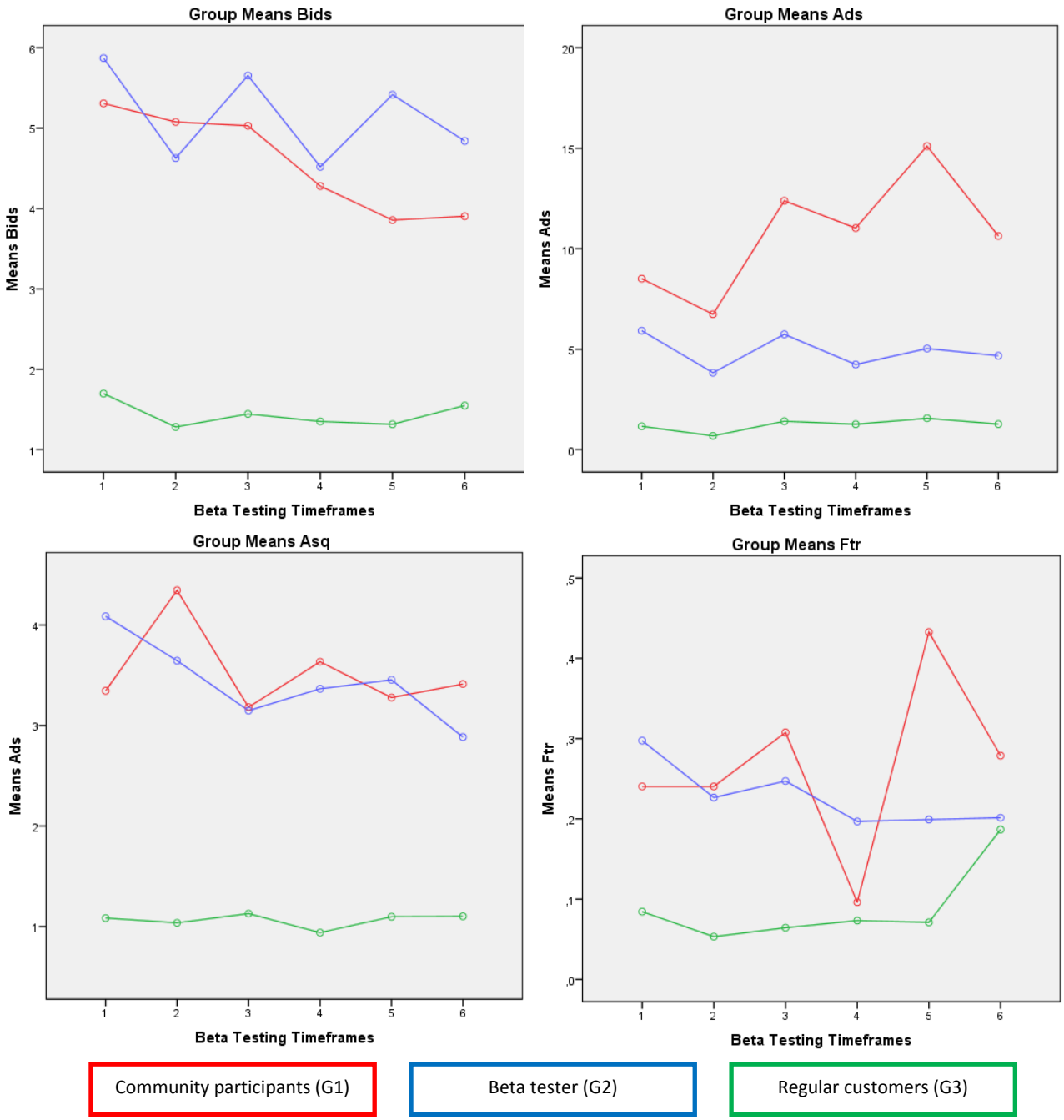
A mixed ANOVA was conducted to assess the impact of being chosen as a beta tester and receiving detailed information about the co-creation efforts of community participants on beta testers' **auction listing behavior (ads)** across nine months of beta testing and nine months post-launch. The transactional variables were non-normally distributed for each group as assessed by Shapiro-Wilk test (all variables $p < .05$). The assumption of sphericity was violated as assessed by Mauchly's test of sphericity ($p < .0005$). Therefore, the multivariate test statistic was used. The homogeneity of covariances was violated as assessed by a Box's Test ($p < .0005$). The homogeneity of error variances was violated as assessed by Levene's Test (all timeframes $p < 0.05$) except for BT 1 ($p = .259$). There

was a significant interaction between being a beta tester and time, Wilks' Lambda = .976, F (5,535) = 2.278, p = .046, partial η^2 = .021. Therefore, as previously stated, the effects for time and group have to be tested separately using a univariate GLMs There were no statistically significant differences in auction listing behavior between the two groups at **BT1**, F (1, 539) = 0.991, p = .320, partial η^2 = 0.002 and **BT2**, F (1, 539) = 3.732, p = .054, partial η^2 = .007. However, there were statistically significant differences in auction listing behavior between the two groups for **BT3**, F (1, 539) = 5.019, p = .025, partial η^2 = .009, **BT4**, F (1,539) = 9.121, p = .003, partial η^2 = .017, **BT5**, F (1, 539) = 9.143, p = .003, partial η^2 = .017, and **BT6**, F (1,539) = 6.398, p = .012, partial η^2 = .012. There was no statistically significant effect of time on auction listing behavior (ads) for community participants (G1), Wilks' Lambda = .898, F (5, 99) = 2.250, p = .055, partial η^2 = .102. There was no statistically significant effect of time on auction listing behavior (ads) for beta testers (G2), Wilks' Lambda = .977, F (5, 432) = 2.063, p = .069, partial η^2 = .023.

A mixed ANOVA was conducted to assess the impact of being chosen as a beta tester and receiving detailed information about the co-creation efforts of community participants on beta testers' **question to sellers asking behavior (asq)** across nine months of beta testing and nine months post launch. The transactional variables were non-normally distributed for each group as assessed by Shapiro-Wilk test (all variables $p < .05$). The assumption of sphericity was violated as assessed by Mauchly's test of sphericity ($p < .0005$). Therefore, the multivariate test statistic was used. The homogeneity of covariances was violated as assessed by a Box's Test ($p < .0005$). The homogeneity of error variances was not violated as assessed by Levene's Test (all timeframes $p > 0.05$). There was no significant interaction between community participation and time, Wilks' Lambda = .993, F (5,535) = 0.749, p = .587, partial η^2 = .007. There was also no substantial main effect for time, Wilks' Lambda = .989, F (5, 535) = 1.224, p = .296, partial η^2 = 0.011. The main effect comparing the two groups was not significant, F (1, 539) = 0.030, p = .863, partial η^2 = .000, suggesting no difference in question asking behavior for the two different groups.

A mixed ANOVA was conducted to assess the impact of being chosen as a beta tester and receiving detailed information about the co-creation efforts of community participants on beta testers' **usage of PayPal** across nine months of beta testing and nine months post launch. The transactional variables were non-normally distributed for each group as assessed by Shapiro-Wilk test (all variables $p < .05$). The assumption of sphericity was violated as assessed by Mauchly's test of sphericity ($p < .0005$). Therefore, the multivariate test statistic was used. The homogeneity of covariances was violated as assessed by a Box's Test ($p < .0005$). The homogeneity of error variances was not violated as assessed by Levene's Test (all timeframes $p > 0.05$) except BT 4 ($p = .054$) and BT 5 ($p < .0005$). There was no significant interaction between being a beta tester and time, Wilks' Lambda = .984, $F(5,535) = 1.700$, $p = .133$, partial $\eta^2 = .016$. There was also no substantial main effect for time, Wilks' Lambda = .984, $F(5, 535) = 1.693$, $p = .134$, partial $\eta^2 = 0.016$. The main effect comparing the two groups was not significant, $F(1, 539) = 0.299$, $p = .585$, partial $\eta^2 = .001$, suggesting no difference in PayPal usage for the two different groups.

Figure 6: Group means of transactional variables during beta testing timeframes



4.3. Mixed ANOVA results / Hypotheses test summary

Table 8: Results summary of mixed ANOVAs

Variable	Timeframes	Interaction effect	Time effect	Group effect
Bids	**TF 1 – TF 6**	No	No	No
Ads	**TF 1 – TF 6**	Yes	G2: T5 > T3	TF 2, TF 3, TF 5, TF 6
Asq	**TF 1 – TF 6**	No	Yes	No
Ftr	**TF 1 – TF 6**	No	No	No
Bids	**BT 1 – BT 6**	No	No	No
Ads	**BT 1 – BT 6**	Yes	No	BT 3, BT 4, BT 5, BT 6
Asq	**BT 1 – BT 6**	No	No	No
Ftr	**BT 1 – BT 6**	No	No	No

Table 9: Hypotheses testing results

Hypothesis	Result	Conclusion
H1		**Not supported**
H1a	No effect	Not supported
H1b	Positive effect	Not supported
H1c	No effect	Not supported
H1d	No effect	Not supported
H2		**Partially supported**
H2a	No effect	Not supported
H2b	Positive effect	Supported
H2c	No effect	Not supported
H2d	No effect	Not supported
H3		**Not supported**
H3a	No effect	Not supported
H3b	No effect	Not supported
H3c	No effect	Not supported
H3d	No effect	Not supported

4.4. **Supplementary analysis: Customer attitude and transactional behavior**

The results of the conducted mixed ANOVAs suggest that there is an increase in auction listing behavior for community participants in the community set-up, co-development and post-launch phases. Clearly, it would be beneficial for managers and academics alike to gather first insights into the underlying mechanisms that trigger those changes to gain a better understanding and guide further research efforts. In addition to that, it is useful for managers to understand how community participants' characteristics such as the motivation to join the community predict customer attitudes such as satisfaction, recommendation intention as well as the transactional behavior itself. Therefore, a statistical stepwise regression was carried as a part of a supplementary analysis to identify important predictors of community participants' attitudes and transactional behavior using the survey and linguistic analysis results as well as community participation and transactional data. Therefore ownership of results, closeness to Marktplaats, seven different motivations to join and satisfaction with the community as well as the emotionality, social processes, cognitive mechanism scores obtained by the LIWC analysis were used in a statistical stepwise regression to predict overall customer satisfaction with Marktplaats, community participation intensity and transactional behavior variables. The stepwise design was chosen in order to identify the most effective set of predictors for the dependent variable (Tabachnick & Fidell, 2007). Thereby variables are automatically added to the regression equation with the objective to maximize the R^2 of the included variables up to the point when it is not possible to make a statistically significant improvement using any of the variables not yet included. Variables are included in the equation if they significantly add to the predicted variance of the dependent variable at the $p = .05$ level and will be again removed from the equation if their significance goes below the $p = .10$ level later in the process (Meyers, Gamst, & Guarino, 2006). Since variables will not be added to the regression equation unless they make a statistically significant improvement to the analysis, all of the independent variables selected for inclusion will have a statistically significant relationship to the dependent variable. However due to the fact that stepwise procedures are notorious for over-fitting, validation analysis is usually

necessary as suggested by Tabachnick and Fidell (2007), but will be limited to a small extend in this study due to the supplementary nature of this part of the analysis. The overall assumptions of running an statistical stepwise regression have been considered, however due to the relatively small sample size, only close to normally distributed data could be obtained for some variables.

Ownership of results, closeness to Marktplaats, seven different motivations to join and satisfaction with the community as well as the emotionality, social processes and cognitive mechanism scores obtained by the LIWC analysis were used in a statistical stepwise regression to predict **overall customer satisfaction with Marktplaats.** The prediction model contained six predictors and was reached in six steps with no variables removed. The model was statistically significant, $F(6, 36) = 19.320$, $p < .0005$, and accounted for approximately 72.4% of the variance of overall customer satisfaction ($R^2 = .763$, Adjusted $R^2 = .724$). Overall customer satisfaction was primarily predicted by higher levels of community satisfaction, motive “curiosity”, motive “dissatisfaction” and lower levels of motive “contact” as well as to a lower extend by higher levels of cognitive mechanisms and lower levels of emotionality. Community satisfaction received the strongest weight in the model followed by motive “curiosity”, motive “contact”, motive “dissatisfaction” and cognitive mechanisms; emotionality received the lowest of the six weights. The unique variance explained by each of the variables indexed by the squared semi partial correlations varied considerably: community satisfaction (~48.7%), motive “curiosity” (~21.5%), motive “contact” (~17.2%), motive “dissatisfaction” (~11.4%) cognitive mechanisms (~3.5%) and emotionality (~3.3%). The raw and standardized regression coefficients of the predictors together with their correlations with customer satisfaction, their squared semi-partial correlations and their structure coefficients can be found in the Table 10.

Table 10: Stepwise regression results "overall customer satisfaction with Marktplaats"

Model	b	SE-b	Beta	Pearson r	sr^2
(Constant)	2.750	.753			
Community satisfaction**	.591	.069	.779	.580	0.487
Motive curiosity**	.206	.036	.526	.376	0.213
Motive contact**	-.203	.040	-.518	.041	0.172
Motive dissatisfaction**	.123	.029	.358	.200	0.114
Cogmech*	.139	.060	.195	.161	0.034
Emotionality*	-.276	.122	-.184	-.176	0.033

Note. The dependent variable was overall customer satisfaction with Marktplaats. R^2 = .763, Adjusted R^2 = .724. sr^2 is the squared semi partial correlation. * p < .05. ** p < .005.

The same predictors were used in a statistical regression to predict **customer recommendation intention.** The prediction model contained four predictors and was reached in four steps with no variables removed. The model was statistically significant, F (4, 38) = 12.037, p < .0005 and accounted for approximately 51.2% of the variance of customer recommendation intention (R^2 = .559, Adjusted R^2 = .512). Customer recommendation behavior was primarily predicted by higher levels of closeness, motive “dissatisfaction” and community satisfaction as well as lower levels of motive “contact”. Closeness received the strongest weight in the model followed by community satisfaction and motive “contact”; motive “dissatisfaction” received the lowest of the four weights. The unique variance explained by each of the variables indexed by the squared semi partial correlations was quite equal: closeness (~12.9%), community satisfaction (~15.8%), motive “contact” (~13.1%) and motive “dissatisfaction” (~14.13%). The raw and standardized regression coefficients of the predictors together with their correlations with recommendation intention, their squared semi-partial correlations and their structure coefficients can be found in the Table 11.

Table 11: Stepwise regression results "recommendation intention"

Model	b	SE-b	Beta	Pearson r	sr^2
(Constant)	.637	.565			
Closeness**	.264	.079	.418	.507	0.129
Motive dissatisfaction**	.112	.032	.387	.228	0.141
Community satisfaction**	.311	.084	.487	.487	0.158
Motive contact**	-.133	.040	-.402	-.054	0.130

Note. The dependent variable was recommendation intention. R^2 = .559, Adjusted R^2 = .512. sr^2 is the squared semi partial correlation. * p < .05. ** p < .005.

The statistical stepwise regressions executed to predict bidding behavior and question asking behavior during the timeframes TF 3 - TF 5.1 as well as community activity didn't yield any results.

Ownership of results, closeness to Marktplaats, seven different motivations to join and satisfaction with the community as well as the emotionality, social processes, cognitive mechanism scores obtained by the LIWC analysis were used in an statistical stepwise regression to predict the **auction listing behavior** in the timeframes TF 3 - TF 5.1. The prediction models for TF 3 and TF 4 contained only one predictor "motive curiosity" and were reached in one step with no variables removed. The models were statistically significant for TF 3, $F(1 / 41) = 4.312$, $p = .044$, $R^2 = .095$, Adjusted $R^2 = .073$; TF 4, $F(1/ 41) = 5.398$, $p = .025$, $R^2 = .116$, Adjusted $R^2 = .095$. The unique variance explained by curiosity indexed by the squared semi partial correlations was 9.48% for TF 3 and 11.62% for TF 4. The prediction model for TF 5.1 contained two predictors ("motive curiosity" and "motive show ideas") and was reached in two steps with no variables removed. The model was statistically significant, $F(1 / 41) = 5.947$, $p = .005$ and accounted for approximately 20% of the variance of auction listing behavior in TF 5.1 ($R^2 = .229$, Adjusted $R^2 = .191$). Auction listing behavior was primarily predicted by lower levels of curiosity as a motive to join the community and to a lesser extent by higher levels the motive "show ideas". The unique variance explained by curiosity was 19.1% and 8.2% by motive "show ideas". The raw and standardized regression coefficients of the predictors together with their correlations with auction listing behavior in TF 5.1, their squared semi-partial correlations and their structure coefficients can be found in the Table 12.

Table 12: Stepwise regression results "auction listing behavior"

Model	b	SE-b	Beta	Pearson r	sr^2
(Constant)	3.601	10.958			
Motive curiosity**	-2.897	.920	-.448	-.385	0.191
Motive show ideas*	2.702	1.316	.292	.195	0.081

Note. The dependent variable was AvgAdsTF5. $R^2 = .229$, Adjusted $R^2 = .191$. sr^2 is the squared semi partial correlation. * $p < .05$. ** $p < .005$.

5. Discussion

In this chapter the findings of the data analysis are presented and interpreted. Primarily, the hypotheses developed in Chapter 2 concerning the impact of community participation on transactional behavior are discussed based on the results of the mixed ANOVAs conducted. Subsequently, the results of supplementary linear stepwise regression analysis are examined in detail.

5.1. Transactional behavior during co-creation phases

The overall results suggest mixed effects of community participation on the different transactional variables (Bids, Ads, Asq and Ftr) during the co-creation phases. The results obtained indicate no effect of community participation on the number of bids placed, questions to sellers asked and payments sent using PayPal across all co-creation phases. Only the number of auctions listed seems to be influenced by community participation as assessed by a mixed between-within subjects ANOVA. Results suggest a statistically significant increased number of auctions listed for community participants during the community set-up, co-development and post-launch phases of the co-creation process whereby the number of auctions listed peaked during the community set-up phase. Although the effect size of the examined differences between community participants and beta testers are relatively small (partial η^2 between .017 and .009), the difference is statistically significant and the economic impact for a large number of community participants can be substantial. As a result, only hypothesis *H2b* was supported by those findings. In addition to that, the increase in the number of auctions listed of community participants during community set-up and co-development phase shows a positive and not the hypothesized negative effect. All other transactional variables displayed no significant effects.

The highest increase in auction listings during the community set-up phase might be based on pleasant anticipation to the community experience or the feeling of appreciation as being chosen as

one of few invited participants. This effect seems to be diminished but still remains statistically significant during the actual community participation in the co-development phase. One possibility is that the effect diminishes due to a different than assumed community participation experience. Other explanations might be offered by the previously hypothesized effect of sensory-specific satiety (Rolls et al., 1981) and the decreased free time available due to heavy involvement in the community activities. They may not lead to a decrease during the co-development as previously hypothesized, but might decrease other positive effects on transactional behavior.

Another interesting finding is that that there is no statistically positive effect during the co-testing phase observable. However, an increase in the number of auctions listed occurs again in the post-launch phase. This exactly fits to the positive effect hypothesized in *H2b* and might be explained by several factors. First, seeing the co-created results in the real world environment might trigger several psychological processes that lead to increased pride, feelings of ownership or connection to the company and brand. These feelings again could likely be the trigger towards increased transactional behavior. In addition to that, it is also possible that the co-created layout and functionalities offer an increased fit to the individual preferences of the community participants. After all this is one of the key goals and motivations behind all co-creation efforts. Therefore, there is a high possibility that this plays at least a role in the determination of post-launch impact of co-creation efforts.

Interestingly, all transactional variables exhibit an overall downward trend likely to be caused by changes in the overall homepage design and technical problems at the beginning of the launch. Even without a negative attitude towards the new design and technical problems, it is reasonable to assume that the need to adjust and get acquainted with the new layout and functions can decrease transactional behavior for a certain timeframe. The only exception is auction listing behavior for community participants which increased overall with considerable positive spikes during the co-creation process. This further supports the indication of a positive effect on auction listing behavior.

Overall the results indicate that the engagement in co-creation activities can influence transactional behavior during and after the actual engagement.

The current study found no evidence supporting the results obtained by Algesheimer et al. (2010), suggesting a potential negative effect of community participation on bidding and auction listing behavior. However, overall research results provide evidence for a complex and dynamic impact on transactional behavior that might differ due to community internal and external factors which might explain differences in obtained effects. In addition to that, the differences in scope and layout of the respective communities might also execute considerable impact on the direction and degree of transactional impact.

The current findings can't support or disprove the often stated informational and educational benefits of community participation (Algesheimer et al., 2010). A way to investigate these effects is to investigate question asking behavior of community participants, because an educational effect might impact the need to ask clarifying questions to sellers. However, no effect could be obtained when compared with the beta testers as a control group in that perspective. Nonetheless, as the scope of the researched co-creation community was not primarily the social interaction among participants it is not very surprising that there was no effect obtained.

5.2. **Transactional behavior during beta testing timeframes**

In order to assess if receiving detailed information about co-creation efforts impacts the transactional behavior, mixed ANOVAs were conducted to examine possible differences in the four transactional variables. The results obtained indicate no effect of that intervention on the number of bids placed, questions to sellers asked and payments sent using PayPal across all co-creation phases. There was a statistically significant difference between beta testers and community participants in BT 3 – BT 6. However, the timing of the divergence of transactional behavior between the two groups suggests that the difference is likely to be caused by the same effect obtained for the co-creation

phases TF 5.1 and TF 5.2. It is likely that the difference is caused by the increase in number of auctions listed by community participants triggered by the launch of their co-created new Marktplaats design in TF 5.1 and TF 5.2 which largely overlaps with BT 3 - BT 6. An assessment and comparison with the regular customer data (G3) supports this interpretation. The transactional auction listing behavior seems to develop similarly for both beta testers (G2) and regular customers (G3) whereas it is increased for community participants (G1). As a result, *H3* is rejected.

Nevertheless, it can still be possible that the communication of co-creation efforts in form of videos, mails and alike impacts the transactional behavior of recipients, too. There are ample possible reasons why this study could not find a significant positive effect. First of all, although there was a sufficient sample size (N=437), the effects might be too small to be statistically significant. Another possibility is that the intervention of receiving information was not strong enough to trigger a statistically significant impact on transactional behavior. Moreover, it is not possible in this real life setting to ensure that all beta testers actually saw the videos of community participants describing their co-creation activities.

5.3. **Results of the supplementary analysis**

The regression results obtained to predict overall customer satisfaction with Marktplaats reveal that the community satisfaction and overall customer satisfaction are closely related and that it is of upmost importance to ensure a pleasant community experience in order to achieve maximized customer satisfaction. This is especially true when considering the huge unique variance explained by community satisfaction alone (~48.7%). The predictors “motive curiosity” and “motive dissatisfaction” also make intuitively sense when they are paired with high community satisfaction as curiosity might have been satisfied and dissatisfaction could be settled. Interestingly, both customer satisfaction and recommendation intention are predicted by lower levels of “motive contact”. This result might give a hint on the somewhat different scope and design of this particular type of customer community in which interaction between customers is mainly a means to an end of co-

creation and a welcome side effect. Therefore, it is not very surprising that customers who joined mainly to get in contact with other customers are not fully satisfied.

Recommendation behavior was also predicted - apart from lower levels of “motive contact” - by higher levels of closeness, community satisfaction and “motive dissatisfaction”. These findings support the results from the regression conducted to predict customer satisfaction. Dissatisfaction might be lowered because of the increased attention and appreciation of being incorporated as a co-creation participant. This positive experience might enhance the willingness to recommend the company to other customers. Community satisfaction should have a similar positive effect. Moreover, it is commonly believed that customers who feel closer to the company are more likely to recommend the product or services offered by the company to other customers (Andreassen & Lindestad, 1998; Barnes, 1997; Homburg, 1993; Knowles & Olins, 2005)

Considering the fact that the only measureable differences in transactional behavior were found in auctions listed between community participants and beta testers, the regression results predicting the auction listing behavior disclose interesting insights. The motive “curiosity” predicted the numbers of auctions listed to some extend during the co-development, co-testing and post-launch phases. However, most noteworthy is that the post-launch phase TF 5.1 obtained motive “show ideas” as a second significant predictor. This matches the possible reasons explained in chapter 5.1 for the positive spike in number of auctions listed of community participants in TF 5.1. Participants who are also highly motivated to participate in such co-creation efforts due to their intrinsic motivation to express and develop their ideas might react to the final implementation of their co-developed solutions with increased behavior. Although the precise psychological processes underlying the changes in transactional behavior haven’t been explored and are outside of the scope of the current study, the results indicate that the positive effect of community participation might be especially strong and present for individuals with a high motivation to show and share their personal ideas.

6. Conclusion

6.1. Theoretical contributions

This study adds to the current state of research in several dimensions. First and foremost, this study contributes to the up to now sparse academic literature researching behavioral impact of customer participation in customer communities using actual transactional data rather than self-reported purchasing intentions. The previously conducted studies were making use of data from the United States and Germany. By using data from the Netherlands this study is thereby shedding light on a previously not researched cultural setting. In addition to that, although a similar business background has been the topic of previous research efforts, it is also enriching the analysis by assessing the impact of two previously unconsidered transactional variables “payments send via PayPal” and “questions asked to sellers”. Additionally, the concept of a co-creation community as a brand related online-innovation community was added to the already substantial literature about different types of customer communities.

Most research in the area has been focused on a simple form of intervention differentiating only between during and pre-community phases. Preexisting research has only been focusing on identifying different stages in the NPD process and not explicitly connected it to the co-creation efforts in customer communities.

This study takes the research one step further by suggesting five different phases in the co-creation process. Doing so enables the analysis to assess the dynamic development of behavioral changes and provides first guidance on potential drivers behind the change. Moreover, the incorporation of these co-creation phases into the analysis of transactional behavioral changes advances preexisting theory by pointing out that the effect of participation on transactional behavior is determined by a more complex mechanism than previously assumed. Previous research pointed out that the main difference for participants is in their degree of activity in the community (posting versus lurking),

however it has to be acknowledged that changes in transactional behavior are not only influenced by being participant and the intensity of participation but also by the overall co-creation community phase. The respective phase is quite obvious in limited timeframe and co-creation focused communities since it is more or less the same for all participants, however, in open and timely unlimited communities individual participants might be in different co-creation phases. Some participants might be in the co-development phase while actively engaging in the feedback and development process for some product while others are in the co-testing phase for a different product they engaged with. The individual co-creation phase is thereby determined by the previous activity and psychological mechanisms within the individual participant. The findings of this study suggest that there is a difference in impact on transactional behavior between phases. This finding and the fact that only the latter form of communities has been used to study community participation effects on transactional behavior might also explain why previous research revealed mixed and partially contradicting results.

At the same time, it is also answering the call of other researches for a longitudinal research design (Algesheimer et al., 2010) by using a time frame as long as 33 months of transactional data. Finally, this study indicatively links different motivations to join a customer community to transactional behavior and different beliefs about and attitudes towards the respective company.

6.2. **Managerial implications**

Several implications for practitioners can be derived from these study results. First of all, it is of utmost importance for managers to gain knowledge about the behavioral impact of customer engagement in co-creation communities in order to being able to assess the economic rewards and risks for the individual company. In addition to that it is vital to understand the underlying dynamic process of the potential behavioral impact in order to maximize the benefit that can be obtained from maintaining customer communities. This study provides evidence based on actual behavioral data that community engagement can have neutral to positive impact on transactional behavior and

that this impact differs significantly between previously identified co-creation phases. By providing first evidence for the dynamic nature of changes in transactional behavior this study provides guidance for practitioners which events and processes might trigger behavioral changes and when to expect a null or positive effect.

This knowledge is not only important in order to enable managers to take measures to enhance positive impacts, but also to ensure proper guidance on measurement timeframes to ensure a valid assessment of behavioral impact. Ideally, measurements should cover all phases of the co-creation process to assess the costs and benefits associated with the respective co-creation community. However, the results of this study suggest that a positive impact is most likely in the community set-up, co-development and post-launch phases of the co-creation process. Interestingly, regression analysis revealed auction listing behavior in those phases to be predicted by lower levels of curiosity as a motivation to join the community. Although a precise analysis is beyond the scope of this study, this finding hints to an underlying mechanism behind the change in transactional behavior that might not trigger change in participants mainly motivated by curiosity. Moreover, the appearance of the motivation of showing ideas as a predictor of auction listing behavior in the post-launch phase indicates that such individuals might be especially prone to exhibit increased transactional behavior as soon as their co-created product or service gets introduced to the market.

Further, the regression analyses conducted suggest that lower levels of getting in contact with other customers as a motive to join the community significantly predict customer satisfaction with Marktplaats and recommendation intention. Seen in the overall context of this study's research setting, this finding points out that it is vital for the customer satisfaction and recommendation intention to clearly communicate the scope and design of the customer community. Because of the fact that the studied community was primarily focused on co-creating a specific solution and used C2C contact simply as a means to an end, customers who joined mainly to get in contact with others might be disappointed. Hence, it is fundamental to communicate the scope and design clearly to

potential community participants and engage in an active expectation management to prevent disappointments.

6.3. **Limitations and further research**

The final results as well as theoretical and managerial implications have to be interpreted within the limitations of this study primarily caused by the data available. Whereby, each limitation is offering an opportunity for further assessment and research.

First and foremost, it has to be mentioned that this study deals with only one very specific research setting. One very important aspect of this is that the business model behind the company is somewhat different from other, more common business models, meaning that customers of Marktplaats, eBay and comparable companies not only “take” but also “make” markets. As previously acknowledged by Manchanda et al. (2012), the mayor determinants product and price are set by the interactions of independent actors and not set and managed solely by the company. Therefore findings might not be universally transferable to different business contexts. Due to the fact that only very limited research has been conducted to assess the impact of community engagement using actual behavior data and the biggest part of it has been using similar research settings - although in a different cultural setting - (Algesheimer et al., 2010; Zhu et al., 2012), future research should be aiming at complementing the findings of Manchanda et al. (2012) by making use of different, less “market making” research settings. Nevertheless this study represents a major progress in the research on transactional impact of community engagement due to the previously not incorporated examination of the dynamic process covering the whole co-creation timeframe.

Next, the analyzed co-creation community consisted of a predefined sample of invited participants which were chosen to participate because of their potential value to the co-creation efforts. Although a comparable group (G2 “beta testers”) was available for analysis to assess transactional behavior and isolate potential engagement impact, it posts difficulties on transferring the findings to

the overall regular customer population. This is especially true when considering customer communities that are open to participation and designed for ongoing interaction. Moreover, the study results have to be interpreted against the background that the two compared groups G1 and G2 both received a treatment (G1: being a community participants; G2: receiving information about co-creation activities) and thus it is difficult to isolate each individual effect. However, the statistical and visual assessment of the data fully supports the presented interpretation.

In addition to that, the very nature of the research setting, the available data and the difficulties in isolating external effects pose other limitations on this study, although an adequate research setting and execution was ensured. The transactional variables were only close to normally distributed and also could not be further normalized by transformations. Due to the usually volatile transactional behavior, untypically high sample sizes might be required to obtain normally distributed transactional variables. Furthermore, although the post-community survey obtained a comparably high response rate (36.1%), the survey sample size was somewhat limited due to the relatively small total number of community participants (N=119). Therefore, the supplementary regression analysis could only provide approximate guidance and indicative results for further research.

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Appendix

Descriptives statistics bidding behavior

	G1 Community Participants		G2 Beta Testers		G3 Regular Users	
	Mean	Std. Deviation	Mean	Std. Deviation	Mean	Std. Deviation
AvgBidsTF1	2,08	4,46	2,04	4,03	,47	1,19
AvgBidsTF2	2,24	4,88	2,03	5,58	,30	1,21
AvgBidsTF3	2,18	4,31	2,31	5,68	,66	2,04
AvgBidsTF4	1,78	2,83	1,86	3,21	,50	1,13
AvgBidsTF5	1,38	2,32	1,64	3,72	,44	1,24
AvgBidsTF6	1,54	3,06	1,75	5,28	,52	2,10
BidsBT1	1,77	3,16	1,96	4,06	0,57	1,73
BidsBT2	1,69	3,68	1,54	3,83	0,43	1,26
BidsBT3	1,68	3,19	1,88	4,05	0,48	1,62
BidsBT4	1,43	2,60	1,51	3,61	0,45	1,58
BidsBT5	1,29	2,73	1,81	4,39	0,44	1,18
BidsBT6	1,77	3,16	1,96	4,06	0,57	1,73

Descriptive statistics auction listing behavior

	G1 Community Participants		G2 Beta Testers		G3 Regular Users	
	Mean	Std. Deviation	Mean	Std. Deviation	Mean	Std. Deviation
AvgAdsTF1	2,97	5,96	1,90	5,11	,41	1,09
AvgAdsTF2	5,07	11,59	2,10	5,86	,48	3,05
AvgAdsTF3	3,77	8,13	2,21	5,83	,50	1,53
AvgAdsTF4	2,98	6,53	1,75	6,16	,37	,89
AvgAdsTF5	4,27	14,48	1,51	4,77	,46	1,10
AvgAdsTF6	3,37	10,32	1,62	5,17	,43	1,17
AdsBT1	2,84	6,96	1,97	8,16	0,39	1,25
AdsBT2	2,25	6,62	1,28	3,98	0,23	0,72
AdsBT3	4,13	10,06	1,91	8,81	0,47	1,61
AdsBT4	3,68	11,81	1,41	5,03	0,42	1,40
AdsBT5	5,04	18,71	1,68	6,73	0,52	1,57
AdsBT6	2,84	6,96	1,97	8,16	0,39	1,25

Descriptive statistics question asking to vendors

	G1 Community Participants		G2 Beta Testers		G3 Regular Users	
	Mean	Std. Deviation	Mean	Std. Deviation	Mean	Std. Deviation
AvgAsqTF1	1,83	2,43	1,66	2,44	,48	,93
AvgAsqTF2	3,25	5,43	1,98	4,41	,42	1,44
AvgAsqTF3	2,23	3,11	1,84	2,84	,58	1,15
AvgAsqTF4	1,40	1,86	1,37	2,16	,40	,74
AvgAsqTF5	1,15	1,97	1,13	2,33	,34	,80
AvgAsqTF6	1,18	1,95	,91	2,01	,41	1,40
AsqBT1	1,12	2,08	1,36	2,51	0,36	0,87
AsqBT2	1,45	3,02	1,22	2,88	0,35	0,91
AsqBT3	1,06	1,57	1,05	2,06	0,38	1,22
AsqBT4	1,21	2,42	1,12	2,65	0,31	0,83
AsqBT5	1,09	2,06	1,15	2,53	0,37	1,05
AsqBT6	1,12	2,08	1,36	2,51	0,36	0,87

Descriptive statistics payments send via PayPal

	G1 Community Participants		G2 Beta Testers		G3 Regular Users	
	Mean	Std. Deviation	Mean	Std. Deviation	Mean	Std. Deviation
AvgFtrTF1	,140	,476	,104	,392	,028	,127
AvgFtrTF2	,230	,872	,137	,719	,017	,162
AvgFtrTF3	,048	,176	,116	,494	,034	,166
AvgFtrTF4	,070	,170	,083	,261	,020	,074
AvgFtrTF5	,094	,292	,064	,231	,027	,116
AvgFtrTF6	,096	,333	,080	,437	,060	,287
FtrBT1	0,080	0,373	0,100	0,412	0,027	0,156
FtrBT2	0,080	0,330	0,077	0,306	0,017	0,134
FtrBT3	0,103	0,294	0,083	0,344	0,020	0,143
FtrBT4	0,033	0,136	0,067	0,341	0,023	0,132
FtrBT5	0,143	0,471	0,067	0,322	0,023	0,137
FtrMN6	0,080	0,373	0,100	0,412	0,027	0,156

Post-community survey

PART 1: Brand attitudes

1. How satisfied areyou overall with Marktplaats on a scale from 1 (=low) to 10 (=high)?

"Overall customer satisfaction"

Question type: Single response

1	2	3	4	5	6	7	8	9	10
❍	❍	❍	❍	❍	❍	❍	❍	❍	❍

2. In addition to the overall satisfaction please state how Marktplaats scores on the following statements and indicate how much you agree or disagree:

Question type: Single response

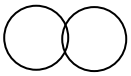
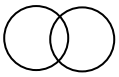
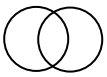
Randomize statements

	Strongly disagree **1**	**2**	**Neutral** **3**	**4**	**Strongly agree** **5**
Marktplaats meets all my expectations *(***Expectancy confirmation)**					
Compared to an ideal service provider Marktplaats is the closest thing around ***(*Performance versus the customer's ideal service provider in the category)**					
I have feelings of trust toward the company. **(affective commitment)**					
It pays off economically to be a customer of the company. **(calculative commitment)**					

3. To what extent fits Marktplaats to you as a person? Give your opinion using the boxes next to the two circles. The left circle stands for the statement, the right circle for you as a person. The more the two circles overlap, the more your personality fits to Marktplaats.

"Feelings of closeness"

Question type: Single response

Marktplaats Myself	
 Far	❑
 Fairly close but separate	❑
 Very little overlap	❑
 Little overlap	❑
 Some overlap	❑
 Big overlap	❑
 Very big overlap	❑
 Complete overlap	❑

4. How likely is it that you would recommend Marktplaats to a friend or colleague, on a scale from 1 (=not at all likely) to 10 (=very likely)?

"Recommendation behavior"

Question type: Single response

1	2	3	4	5	6	7	8	9	10
❍	❍	❍	❍	❍	❍	❍	❍	❍	❍

PART 2: Community engagement

5. Indicate whether the following reasons apply to your participation in the community at two moments: a) During your first visit to the community and b) Now, at this time.

You can move the arrow by dragging it or by clicking on the right place on the slider

"Motivation to join"

Question type: Single response – slider

Loop Page 1: Statement 1,2,3,4
Loop Page 2: Statement 5,6,7

Statements:
1. I take part in the community because of the financial reward that I receive
2. I take part in the community because I want to share my ideas with Marktplaats
3. I take part in the community because I want to improve my skills
4. I take part in the community because I like to think about the future of Marktplaats
5. I take part in the community because I am dissatisfied about the current user experience on Marktplaats
6. I take part in the community out of curiosity
7. I take part in the community because I like to get in contact with other users

	1	2	3	4	5	6	7	8	9	10
During my first visit to the community (2011)	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍
Now (2013)	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍

6. How satisfied are you generally with the community on a scale from 1 (low) to 10 (= high)?

"Satisfaction with community"

Question type: Single response

1	2	3	4	5	6	7	8	9	10
❍	❍	❍	❍	❍	❍	❍	❍	❍	❍

7. As a community member have you played an important role in the renewal of the Marketplace website. To what extent do you agree / disagree with the following statements.

"Ownership of results"

Question type: Single response

	Strongly disagree **1**	**2**	**Neutral** **3**	**4**	**Strongly agree** **5**
I feel that I have done this renewal of Marktplaats myself					
I feel very much involved in this renewal of Marktplaats					
I feel like I own this renewal of Marktplaats					

PART 3: Marktplaats participation

8. Following your participation in the community, how do you think your activity Marktplaats.nl has changed?

"Subjective change in behavior"

Please indicate to what extent your opinion is similar to the left or the right item.

Question type: Single response

Decreased	<<	<	0	>	>>	Increased
My number of auctions listed has decreased	❍	❍	❍	❍	❍	My number of auctions listed has increased
My number of placed bids has decreased	❍	❍	❍	❍	❍	My number of placed bids has increased
My number of contacts with vendors has decreased	❍	❍	❍	❍	❍	My number of contacts with vendors has increased
My number of payments has decreased	❍	❍	❍	❍	❍	My number of payments has increased

PART 4: Consumer Brand Related Actions

9. What action has your participation in this community triggered? Select all actions that apply.

"Consumer brand related actions (COBRAs)"

Multiple response, last is exclusive

- ❑ I read messages or viewed videos about Marktpkaats on the Internet **(consuming)**
- ❑ I follow Marktplaats in social media (such as Twitter en Facebook) **(contributing)**
- ❑ I have a posted a tweet, status update or message on a blog / forum about Marktplaats **(creating)**
- ❑ Other, namely .....
- ❑ None of the above

10. Finally, as a result of your participation in this community, to how many people did you talk about Marktplaats?

Open numeric

Max 1000

Descriptive Statistics Survey Results

	N	Minimum	Maximum	Mean	Std. Deviation
Customer Satisfaction	43	4	10	8,02	,96
Expectancy Confirmation	43	2	5	3,77	,72
Performance vs Ideal Provider	43	2	5	4,16	,61
Affective Commitment	43	2	5	3,70	,80
Calculative Commitment	43	2	5	4,09	,81
Closeness	43	2	8	5,21	1,28
Recommendation Behavior	43	4	10	8,70	1,30
Motive_Compensation	43	1	10	4,58	2,48
Motive_Show Ideas	43	2	10	7,81	1,72
Motive_Knowledge	43	1	10	5,26	2,65
Motive_Intrinsic Motivation	43	4	10	7,93	1,56
Motive_Dissatisfaction	43	1	10	4,30	2,81
Motive_Curiosity	43	1	10	6,56	2,46
Motive_Contact	43	1	9	4,88	2,45
Satisfaction w Community	43	3	9	7,23	1,27
Ownership	43	3	14	9,44	2,64
Change Ads	43	1	5	3,33	,87
Change Bids	43	1	5	3,23	,84
Change Asq	43	1	5	3,30	,83
Change Ftr	43	1	5	3,05	,75
COBRA Consuming	43	0	1	,35	,48
COBRA Contributing	43	0	1	,05	,21
COBRA Creating	43	0	1	,09	,29
Number of WOM contacts	43	0	60	14,70	12,88
Valid N (listwise)	43				

Descriptive Statistics Motivation to join (sorted descending)

	N	Minimum	Maximum	Mean	Std. Deviation
Motive_Intrinsic Motivation	43	4	10	7,93	1,56
Motiv_Show Ideas	43	2	10	7,81	1,72
Motive_Curiosity	43	1	10	6,56	2,46
Motiv_Knowledge	43	1	10	5,26	2,65
Motive_Contact	43	1	9	4,88	2,45
Motiv_Compensation	43	1	10	4,58	2,48
Motive_Dissatisfaction	43	1	10	4,30	2,81
Valid N (listwise)	43				

Descriptive Statistics LIWC Results

	N	Minimum	Maximum	Mean	Std. Deviation
Cogmech	91	0,00	15,79	6,50	1,86
Social	91	0,00	13,25	4,60	1,88
Emotionality	91	0,00	5,63	2,80	,85
Valid N (listwise)	91				

Descriptive Statistics Community Activity

	N	Minimum	Maximum	Mean	Std. Deviation
GroupTotalPageviews	104	2	5718	442,39	856,51
GroupTotalPosts	104	0	564	40,57	85,60
GroupTotalVisits	104	1	563	29,44	66,23
Valid N (listwise)	104				